

## Memorandum

To: ETAAC Committee  
Re: ETAAC Big Ideas  
From: Bob Epstein and Sarah Harris, E2C2  
Date: August 3, 2007

ETAAC Chairman Alan Lloyd and I have asked that each member of the ETAAC committee to come to our August 14 meeting with a few “game-changing” ideas that can produce significant emission reductions (on the order of at least one million tons/year) with accompanying incentives for innovation and economic benefits to California. What follows are four ideas that we have been thinking about over the past few weeks based on conversations with some of you and some of our E2 members, plus lots of suggestions from the public. We hope this document helps you to prepare your thoughts on the game-changing ideas you’ll be bringing to our August 14<sup>th</sup> meeting.

### *Energy parks*

**The problem:** Two of the major barriers to utility-scale clean energy generation in California are inadequate transmission capabilities and a time-consuming permitting process. For example, permitting for most solar projects takes between 12 and 18 months. The transmission problem is a chicken-or-egg problem: transmission won’t get built unless energy producers require it, but energy producers won’t choose a location unless it has transmission capabilities.

**Possible solution:** Energy parks (aka “renewable energy enterprise zones” or “competitive renewable energy zones”) could address the transmission and permitting barriers to clean energy production. Energy parks are sites throughout the state designated for clean energy production (solar, wind, biomass, or geothermal) that offer a potential energy producer both a “Master permit” that cuts down individual project permitting time, as well as a connection to the state’s energy grid. Energy parks reduce the start-up time required to begin clean power generation and concentrate renewable power generators in one place to simplify transmission needs. Ultimately, energy parks offer the benefits of multiple renewable energy projects for less overhead.

Much of the land appropriate for utility-scale renewable energy production in California is currently managed by the federal Bureau of Land Management (BLM). Another possible location for energy parks could be Williamson Act land. California lawmakers are currently considering a bill that would allow biofuels production on Williamson Act land, and this could possibly be expanded to allow solar and wind production as well. The state will need to collaborate closely with any federal agencies and other potential landowners to negotiate reasonable terms for the use of the land. Once the state has negotiated an agreement with the landowner for the energy park, individual power producers can apply in a competitive process for long-term leases on parcels within the park. Potential tenants agree to comply with energy and

environmental performance standards, and must demonstrate possession of a power purchase agreements with utilities.

To reduce the time-consuming permitting process required of each individual power producer, the state would develop a “Master permit” for each park. The Master permit would include programmatic environmental permits for both the site and the transmission. To develop these Master permits, the state will need to work with the Federal Department of Energy, which plays a role in the permitting process according to the Energy Policy Act of 2005. The process of developing a Master permit for each energy park will take some time, but will reduce the individual permitting time required of each tenant thereafter. Even though energy parks are envisioned to be homogeneous (i.e. produce only one type of renewable power), each tenant applying for a lease within the park will have unique environmental impacts. This means that each project will still have to go through an individual permitting process, but the energy park’s Master permit will help to minimize the time this requires.

In addition to negotiating terms with landowners and developing Master permits, the state would play a role in building transmission capacity. This is already happening in both Texas and Colorado. In California, CRETI is currently conducting a study to identify priority electricity transmission corridors within California and neighboring states. Concentrating renewable energy production in energy parks will ultimately reduce the amount of transmission infrastructure required.

One possible funding mechanism to improve the state’s transmission infrastructure could be a mandatory surcharge of 5% on all energy bills paid in the state, generating enough revenue to fund clean energy infrastructure. Many European countries have such tariffs and could serve as an example if the state chooses to implement this structure.

### ***California Carbon Trust***

**The problem:** We want to encourage the most cost-effective carbon reduction projects to be built as early as possible. We need to find a way to use auction revenues in a way that lowers the cost of AB32 and achieves cost-effective carbon reductions. We would like to prevent price volatility so that the economy can count on a stable price for carbon when making investment decisions. Finally, we would like to develop a mechanism that gives us an early price signal and helps the market get started in advance of 2012.

**Possible Solution:** A California Carbon Trust could act as an enabler of the carbon market by purchasing emissions credits in sectors outside the cap and selling or retiring them, as needed, in order to help stabilize the market price of carbon. Revenues for the Trust could come from pre-2012 auctions which would help establish an early price signal for carbon and would jump-start the carbon market.

The California Carbon Trust would speed up in-state GHG reductions in a cost-effective manner by purchasing GHG reductions from a set of project categories that otherwise might not be funded. Two types of projects that might obtain funding could include (1) projects for which California has established accounting protocols to measure and verify the emissions reductions, or (2) projects for which no

accounting protocol currently exists, but which can demonstrate to the Trust real, verifiable greenhouse gas emissions reductions nonetheless. One of the problems observed with CDM projects is that high transaction costs prevent small projects from getting funded, even though small projects often provide quality emissions reductions and economic development potential. The Carbon Trust could overcome this barrier by bundling together the emissions reductions of many small projects. As the purchaser of both large and small GHG reducing activities, the Carbon Trust would own the carbon savings generated by each project. The Carbon Trust could become that largest purchaser and owner of emissions reductions in the state.

The Carbon Trust could choose to do two things with the carbon savings it purchases, depending on the condition of the market. If the market is functioning smoothly, the Trust could retire the carbon savings credits, removing carbon from the air and helping the state reach its 2020 target easing the pressure on companies under the cap. Alternatively, if the price of carbon is too high or fluctuating widely, the Trust could sell its verified credits as offsets to companies within the cap, stabilizing the carbon price and bringing down to cost of compliance to companies under the cap. In this way, the Carbon Trust fills a role similar to that of the Federal Reserve Bank, regulating the price of carbon and providing a sense of certainty over time. The Carbon Trust is essentially a dynamic manager of the price of carbon with a long-range view, obviating the need for a safety valve and avoiding static regulations like price floors or ceilings.

In addition to reducing the volatility of the market, the Carbon Trust offers a sensible mechanism for the use of auction revenues. Using auction revenues to fund GHG reductions through the Carbon Trust is an equitable and cost-effective method of advancing AB32's primary goal: to remove carbon from the atmosphere.

The state might consider offering early auctions in both 2008 and 2010 of a small percentage of the 2012 and beyond allocations. This early auction proposal presupposes that the state has decided not to grandfather allocations based on historic emissions and that it establishes a minimum percentage of allowances to be auctioned in 2012. One or more early auctions would help to set an early price signal and would remove some of the uncertainty about rule-making, jump-starting the market for carbon in advance of 2012. To ensure the reliability of the price signal set by the early auctions, California could restrict early carbon allowance purchases to capped entities, disallowing speculator purchases. We should expect that a price discovery period will probably reveal a price lower than expected; this is what has happened historically in other similar schemes. Early auctions would allow the state to "learn by doing," essentially serving as a trail period. The state would have the opportunity to make mistakes and correct its course before 2012.

Post-2012, auction revenues will likely represent a large sum of money available for GHG reduction projects. To receive Carbon Trust funding for GHG reducing activities, project developers (which could include community groups) would submit an application to the Trust detailing their plans, including the amount and price per ton of emissions reduced. Projects would be judged based on the cost-effectiveness of their GHG reduction plans, the carbon equivalent to the state's Carl Moyer program. Projects that demonstrate real, verifiable, additional emissions reductions at the lowest cost per ton will win Carbon Trust funds.

An example of a possible “Carbon Moyer” project for which no accounting protocol currently exists might be a neighborhood energy efficiency project in a low-income community that otherwise would not be funded. The community would work together as a project developer to propose the GHG reduction activities to the Carbon Trust and would offer the Trust a price for the carbon rights. The Trust would hold periodic competitions and the most cost-effective projects would be selected.

Through these types of projects, the Carbon Trust could fill an important environmental justice role. As an additional equity consideration, the Trust could choose to divide up the available funds based on geography or population, so that each county, region, or population center could be guaranteed some equitable portion of the project funding. Or, the Carbon Trust could create additional incentives for projects that provided auxiliary benefits, such as green collar jobs, by fast-tracking these projects or paying them slightly more per ton of carbon reduced.

“Carbon Moyer” projects are expected to achieve GHG reductions at a lower cost per ton than reductions in capped sectors. For example, suppose a Carbon Moyer project reduces a ton of emissions at a cost 25% lower than the market price for carbon. If the price of a ton of CO<sub>2</sub> in the market is \$10, Carbon Moyer projects can reduce a ton of CO<sub>2</sub> emissions for \$7.50. If \$100 of auction revenues is put directly into Carbon Moyer projects, the Carbon Moyer projects will reduce 13.33 tons of emissions compared to only ten tons of emissions reduced by the marketplace.

To augment the amount of money available for “Carbon Moyer” projects, the Carbon Trust might sell some portion of its verified emissions reduction credits as offsets to the voluntary market. The Carbon Trust could be a potential seller of carbon to companies that offset travel and aviation emissions. Another potential source of revenue for the Trust could be penalties and fees for companies that fail to comply with their cap. Based on past experience, however, revenue from fees and penalties is expected to be minimal. Finally, there may be a way to involve private capital in the financing of GHG reduction projects through the Carbon Trust. Involving private capital may cause the Carbon Trust to be driven more by economics than by politics and could lower administrative costs.

### ***CCS for Natural Gas and Biomass***

**The problem:** Even accounting for the potential of energy efficiency, renewable energy and other strategies to substantially reduce emissions, we will discover that to reach the state’s 2020 targets we need to seriously consider geologic carbon capture and storage. However, even if California power producers want to capture the carbon from their production process, they currently have no assurance that a facility will exist to store the carbon. Furthermore, although thousands of miles of transmission lines already exist throughout the U.S., California lacks adequate infrastructure to transport CO<sub>2</sub> from separation to storage.

**Possible solution:** The state could choose to operate (under contract) one or more CCS sites that can receive and store carbon. The state could address the transmission barrier by building pipelines from the storage site to likely power generation sites. Knowing that the transmission and storage capacity exists will encourage natural gas and biomass energy producers to separate carbon out of their waste stream because they will be able to capture the economic benefit of the carbon they are keeping out of the atmosphere.

While CCS is commonly associated with coal in other states, in California, it could become important for power generation from biomass and natural gas. For example, Clean Energy Systems ([www.cleanenergysystems.com](http://www.cleanenergysystems.com)) has a proof of concept underway for a natural gas electric generation system with CCS. A similar biomass system would actually remove CO<sub>2</sub> from the air. The most costly part of CCS is separating CO<sub>2</sub>; if the energy required for this process is less than 10 percent of the facility's energy production capacity, CCS can be financially feasible. Depending on the price of carbon, sequestration could be very profitable and thus accelerate GHG reductions.

Despite some initial opposition to CCS in California, experts believe that testing the technology and building a regulatory framework for CCS is a necessary step towards reaching the state's 2020 targets. Current permitting processes for underground injection were not designed for CCS and new regulations and monitoring requirements are clearly needed, at both the state and federal levels. The CEC believes CCS can be safe and effective and, along with US EPA, is currently funding validation studies by WestCarb in six western states ([www.westcarb.org](http://www.westcarb.org)).

Following the WestCarb validation studies, the Division of Oil and Gas within the California EPA could develop a list of locations suitable for underground carbon storage based on geologic and scientific research. The suitability of the geologic formations is one of the most important decisions in ensuring the safety and durability of underground carbon storage. In choosing a suitable site, the state will also have to consider public safety concerns and political issues. The state would remain in charge of permitting and ongoing management of the CCS sites.

Beyond identifying and developing geologic storage sites, the state will also need to play a role in developing transmission lines, possibly along railroad rights-of-way. With assurances from the state that there will be one or more sites to store carbon and a method of transporting it from their facility to the storage location, natural gas and biomass operators will be more likely to plan for and invest in facilities with CO<sub>2</sub> capture capabilities.

### ***California Low Carbon Manufacturing***

**The problem:** How do we encourage new manufacturing in California and keep existing manufacturing jobs in competitive industries? We might be able to take advantage of the lower carbon content of California-manufactured products: even though labor and overhead costs might be lower outside the state, more greenhouse gases are released into the atmosphere due to less efficient and higher carbon content energy supplies.

**Possible solution:** We would like to encourage the production and consumption of goods that are manufactured with minimum lifecycle greenhouse gases – ideally produced within California to maximize the economic value and minimize transportation of the products. We suggest exploring two possible solutions: (1) California “Carbon Star” certification. The state could certify (or cause a third party certification) and promote low-carbon products with a program similar to the Energy Star system. This

program would naturally give preference to California-made products based on a life-cycle analysis of their carbon content, including transportation miles. This type of program would also satisfy a desire for consumer education and participation. (2) A Buy California Campaign would allow the state to offer some financial incentive to businesses and consumers that purchase California-manufactured products with lower carbon content rather than similar products manufactured elsewhere. This incentive could work in concert with the existing programs; for example, the state CSI program could offer a slightly higher per watt rebate for the installation of in-state manufactured solar panels.

A California “Carbon Star” program would harness the purchasing power of Californian consumers while educating the public about sustainability concepts such as buying local. The Carbon Star certification would be similar to the Forest Stewardship Council (<http://www.fscus.org/>) certification but for manufactured products like solar panels or double-paned windows. For example, a solar panel produced and sold in California would have a higher rating compared to one produced in China and sold in California because the energy mix used to produce the California panel is cleaner and more efficient, and the solar panel is transported much less of a distance. This lower carbon content would be reflected in the number of “carbon stars” the product is allowed to display on its packaging and marketing materials (the lower the carbon content, the more stars). The state would play an active role in causing the certification and marketing of California Carbon Star products. As consumers become more aware and more concerned about global warming, they will begin to vote with their pocketbooks and, as for organic and fair trade products, will be willing to pay more for the lower carbon products.

California-made products will naturally have lower carbon content than those produced outside the state due to California’s clean energy mix and energy efficiency. Lower transportation distances further reduce the product’s carbon footprint compared to out-of-state production. The added value of a high “carbon star” rating on California-manufactured products will create a market incentive for manufacturers to locate in California. More manufacturing companies mean more jobs and more tax revenues for the state, plus more choices for the environmentally-conscious consumer.

One way of increasing the chances for success of a “Carbon Star” certification program would be to bias the California Carbon Trust towards projects that use Carbon Star products. For example, a community-based home weatherization project that used California manufactured double-paned windows would be fast-tracked or otherwise treated preferentially compared to a similar project that used out-of-state manufactured goods.

For a Buy California Campaign, California might emulate the incentive structure of the Massachusetts’ Technology Collaborative (MTC), which offers Renewable Initiative Rebates similar to California’s Self Generation Incentive Program (SGIP) and the California Solar Initiative (CSI). One of the major differences between the programs is that MA offers an additional incentive (an extra \$0.25/watt for solar and an extra \$2.00/watt for fuel cells) if Massachusetts-manufactured components are used. Similarly, Washington enacted Senate Bill 5101 in May 2005, establishing production incentives for individuals, businesses, or local governments that generate electricity from solar power, wind power or anaerobic digesters. The incentives range from \$0.12/kWh - \$0.54/kWh, depending on technology type and where equipment was

manufactured. In California, the additional incentive level would have to be high enough to offset the one-time sales tax that manufacturers must pay on the purchase of equipment, as this is cited as one of the major deterrents to manufacturing in-state.

In addition to offering rebate incentives high enough to offset the sales tax on manufacturing equipment, a Buy California Campaign will need to have stringent rules about what it means to be “manufactured in California” so that companies that simply add a few finishing screws to their products in California are not eligible. One way to evaluate this is to analyze state tax payments.

While we acknowledge that ultimately, much manufacturing may be exported overseas and that the cleantech industry must stand on its own without state subsidies, we believe that California can benefit from a time-limited incentive program that promotes the growth of in-state cleantech manufacturing. The goal of a Buy California campaign ought to be to get a new market established, rather than to create corporate dependence on an entitlement program.